Cambridge O Level

Cambridge International Examinations
Cambridge Ordinary Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

* 4 3 4 3 1 3 0 7 3 9 *

BIOLOGY **5090/61**

Paper 6 Alternative to Practical **October/November 2015**

1 hour

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
Write your answers in the spaces provided on the Question Paper.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

This document consists of **11** printed pages and **1** blank page.

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Answer **all** the questions in the spaces provided.

1 Some students investigated the effect of adding a known volume of an enzyme to some crushed apricot fruit. The mixture was stirred to mix the enzyme thoroughly with the fruit. The mixture was filtered. The volume of juice collected is shown in Fig. 1.1**A**.

To a second sample of fruit they added the same volume of water instead of the enzyme. This mixture was filtered. The volume of juice collected is shown in Fig. 1.1**B**.

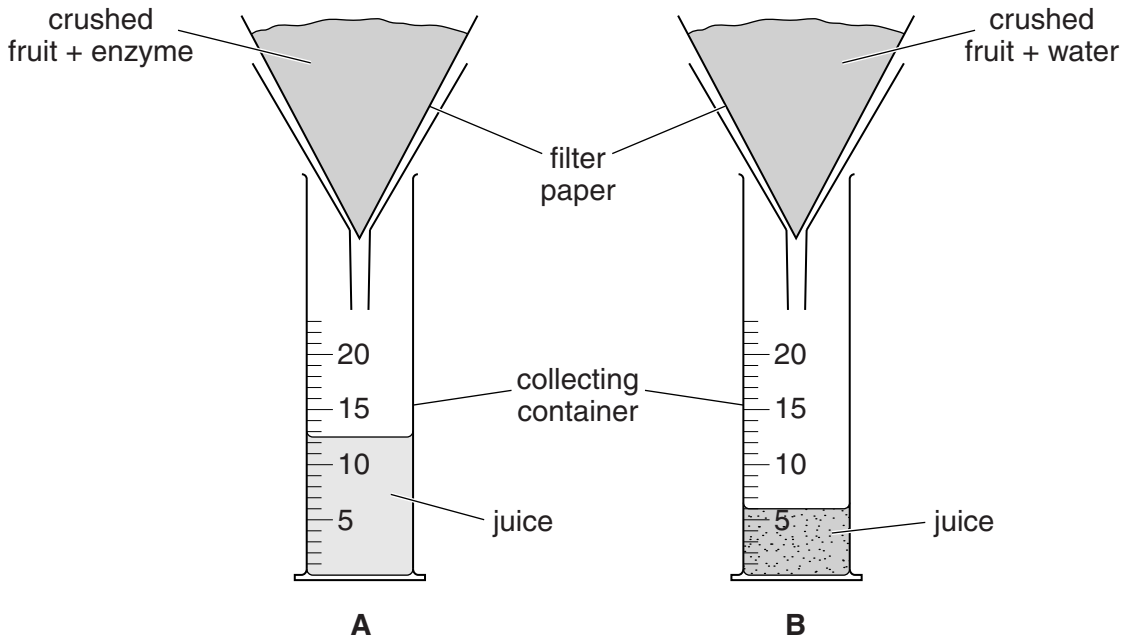

Fig. 1.1

(a) **(i)** In Table 1.1, record the volumes of juice collected as shown in Fig. 1.1.

Table 1.1

sample of juice	volume / cm^3	appearance
A		clear
B		cloudy

[2]

(ii) The enzyme is used in the production of fruit juice on a large scale. Using the information in Table 1.1, suggest **two** reasons why the enzyme is used.

.....

.....

.....[1]

(iii) Suggest why water was added to the crushed fruit in **B**.

.....

.....[1]

(iv) State **two** variables that need to be kept constant in this investigation.

1 .....

2 .....[2]

(v) Suggest **two** ways in which the investigation could be improved to increase the reliability of the results.

1 .....

.....

2 .....

.....[2]

(b) Fig. 1.2 shows half of a fresh apricot.

magnification ×1

Fig. 1.2

Make a drawing of this fruit, twice the size of the actual fruit.

On your drawing, indicate where the fruit was attached to the parent plant using the letter **P**.

[4]

(c) Ripe fruits contain reducing sugars.

Describe how you could test a sample of fruit to show that it contains reducing sugars. Include **one** safety feature in your method.

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.....[4]

(d) Fruits, such as apricots, can be preserved by drying them in the sun.

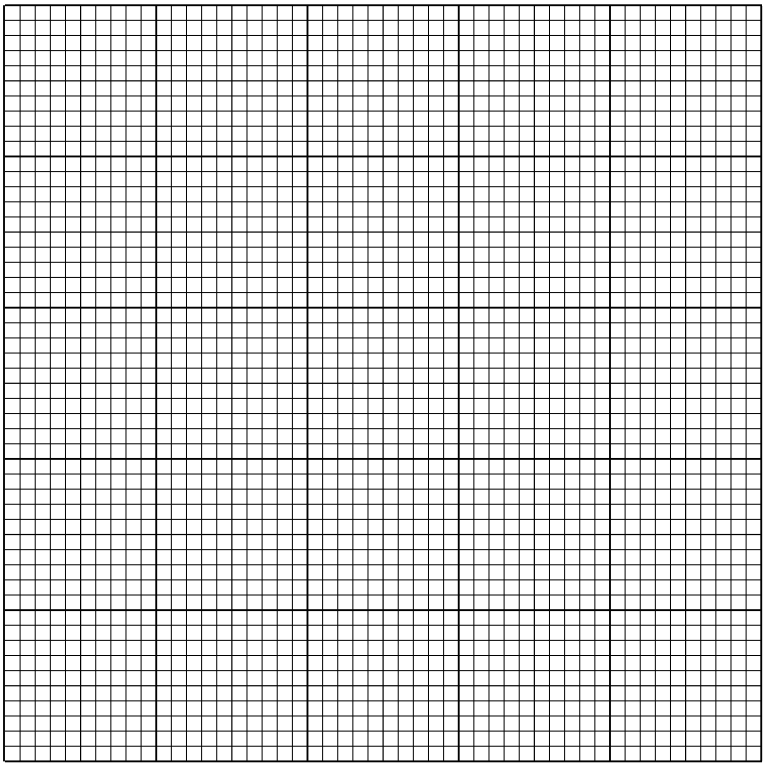
Some students investigated the changes in mass of some fruits as they were left to dry over five days. The results are shown in Table 1.2.

Table 1.2

time/days	mass/g	total loss in mass/g
0	30.0	0.0
1	22.5	7.5
2	17.0	13.0
3	12.0	18.0
4	8.5	
5	7.0	

(i) Calculate the total loss in mass/g for days 4 and 5 and complete Table 1.2. [2]

(ii) Construct a graph to show the total loss in mass of the fruits with time.



[4]

(iii) Suggest why drying fruit helps to preserve it.

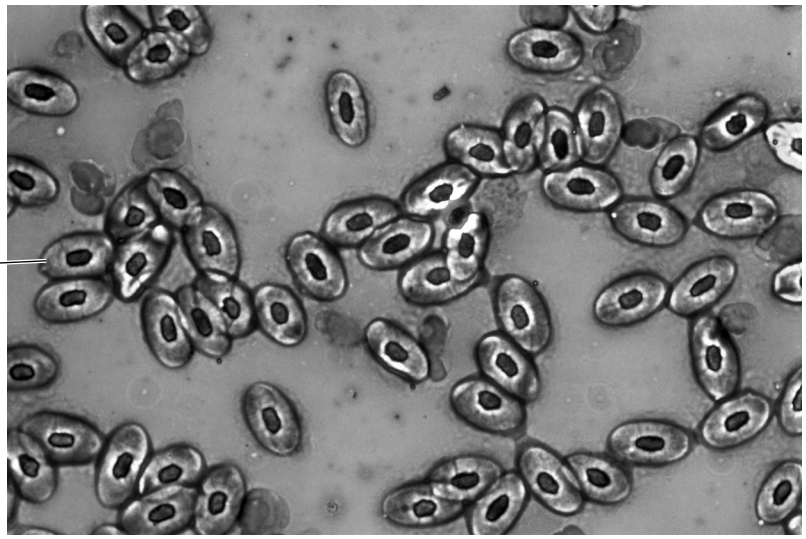
.....

.....

.....[1]

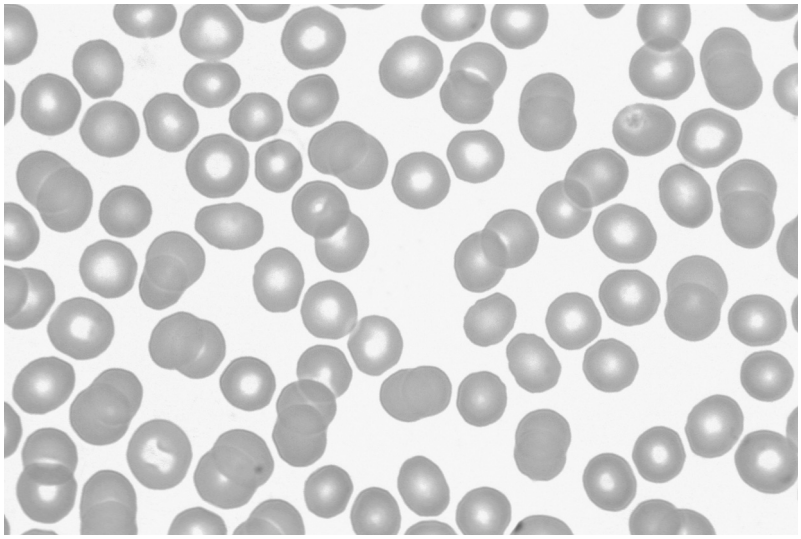
[Total: 23]

2 Fig. 2.1 shows red blood cells from a frog and Fig. 2.2 shows red blood cells from a human, as seen under the microscope.



magnification × 5000

Fig. 2.1



magnification × 400

Fig. 2.2

(a) **(i)** Complete Table 2.1 by describing differences that can be seen between the named features of the blood cells in these two samples.

Table 2.1

feature	frog blood cells [Fig. 2.1]	human blood cells [Fig. 2.2]
shape		
nucleus		

[2]

(ii) The cell labelled **X** in Fig. 2.1 measures 10 mm in length.

Calculate the actual length of cell **X**. Show your working.

actual length = ...[3]

(iii) A human red blood cell is 0.007 mm in diameter.

Calculate the number of times a human red blood cell is larger than the frog red blood cell. Show your working.

.....[1]

(b) Explain how, using features visible in Fig. 2.1 and Fig. 2.2, blood is adapted for transporting oxygen around the body.

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.....[2]

[Total: 8]

3 A student wanted to investigate how beetles respond to humidity.

Ten similar beetles were collected from beneath leaves on the ground in a forest and taken to the laboratory.

In the laboratory, the apparatus shown in Fig. 3.1 had been set up and left in place for 15 minutes.

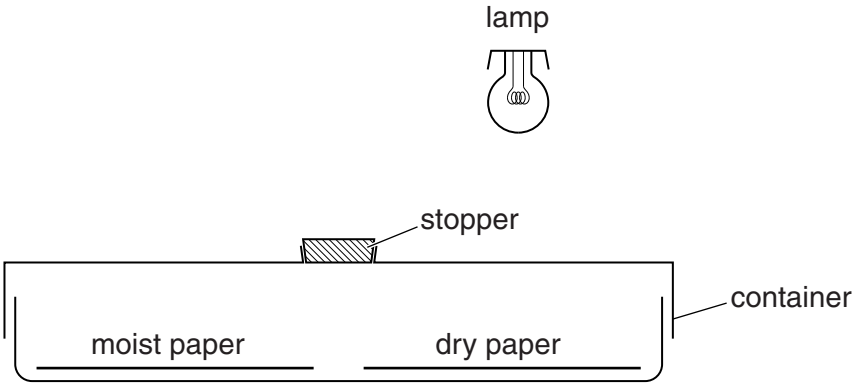

Fig. 3.1

The stopper was taken out of the central hole. The beetles were put into the container and the stopper replaced.

(a) **(i)** Suggest why the student waited for 15 minutes before introducing the beetles into the apparatus.

.....

.....[1]

(ii) The dry part of the container had been treated with a chemical drying agent.

Suggest **one** advantage and **one** disadvantage of doing this.

advantage .....

.....

disadvantage .....

.....[2]

(b) **(i)** Suggest **one** variable in this investigation, apart from humidity, that may affect the distribution of the beetles.

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.....[1]

(ii) Suggest how this effect could be reduced.

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.....[1]

(c) After 20 minutes, the student observed that all the beetles had settled on the moist paper.

Design an investigation, using similar apparatus, to show the effect of light on beetle distribution.

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.....[4]

[Total: 9]

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